DOCUMENT RESUME

ED 427 028 TM 029 404

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TITLE	Dispositional Modes of Functioning and Authentic Learning.
PUB DATE	1998-11-00
NOTE	16p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (27th, New Orleans, LA, November 4-6, 1998).
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Creativity; Educational Psychology; Higher Education; *Learning; *Personality Traits; Student Attitudes; *Student Characteristics; *Undergraduate Students
IDENTIFIERS	*Authentic Learning; Functional Properties

ABSTRACT

How dispositional modes of functioning relate to students' domain-comprehensive perspectives on authentic learning in an undergraduate educational psychology course was studied with 40 students. Course instructors rated students with regard to their dispositional modes of functioning as creative or habitual, dynamic or active, and constructive or unconstructive. Also rated was students' written work for the course using whole theme standards of authentic learning. Results provide initial support for the hypothesis that students with creative, dynamic, and constructive modes of functioning may indeed be better prepared for future learning. These students appeared to benefit most where the production, reorganization, advancement, and utilization of knowledge is concerned. Recommendations for future study are suggested. Appendixes contain a list of criteria of authentic learning and a phi coefficient 2 x 2 contingency table. (Contains 17 references.) (SLD)

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Running head: MODES OF FUNCTIONING AND AUTHENTIC LEARNING

ED 427 028

Dispositional Modes of Functioning and Authentic Learning

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Paper presented to the

Mid-South Educational Research Association

New Orleans, November 1998

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Abstract

This paper investigates how dispositional modes of functioning relate to students' domain-comprehensive perspectives on authentic learning in an undergraduate educational psychology course. Course instructors rated students with regards to their dispositional modes of functioning. Also rated were students' written work for the course using wholetheme standards of authentic learning. The findings and recommendations for future study are reported and discussed.

Dispositional Modes of Functioning and Authentic Learning

Introduction. As addressed by Iran-Nejad and Howell (1998), developments in biofunctional cognition have suggested certain dispositional modes of functioning which can influence an individual's ability to add to and reorganize the knowledge base and optimally influence learning. These advancements are of practical importance to educators. As the leaders of this symposium have stated, "it should make a difference if students approach the course in a creative versus habitual, dynamic versus active, or constructive versus unconstructive mode of functioning" (p. 2). As a result of these identified modes of functioning, experiences, performances, and successes where learning is concerned can be affected and facilitated significantly.

Various research has sought to detail how these modes of functioning affect learning, performance, and thought production in a variety of ways (For specifics, see Iran-Nejad, 1990; Iran-Nejad & Cecil, 1992; Iran-Nejad & Chissom, 1992; Iran-Nejad, Gregg, Ellis, & Casareno, 1998; Iran-Nejad & Ortony, 1984). Essentially, what these studies entail and conclude specifically is that it seems that those in the creative, dynamic, and constructive modes are most prepared and benefited where the production, reorganization, advancement, and utilization of knowledge is concerned. Furthermore, it has been cited that it is these optimal modes that seem to be most valuable to the learner in areas such as performance and reorganization of knowledge (Iran-Nejad & Chissom, 1992).

The focus and purpose of this study, therefore, will be to find evidence that will help to further affirm and validate assumptions initiated by the above research. Thus, it is hypothesized that those rated as creative, dynamic, and constructive will report more accurate or complete descriptions of a subject that they are asked to consider and investigate individually using their own intuitive knowledge base and where no prior knowledge is attained or is given in class. It is also hypothesized that those rated as habitual, active, and unconstructive will report less accurate or incomplete descriptions of

the subject. In other words, the relationship of students assessed modes of functioning and their preparation for future learning as a result of their ability to develop understanding and knowledge of a specific subject through intensive reflection, self - thought, and exploration throughout the semester will be explored in this study.

Nature of the study. It is often cited and suggested that those in the creative, dynamic, and the constructive modes flourish where the advancement, utilization, and reorganization of knowledge is concerned when we provide opportunities for individual exploration as well as opportunities for collaboration with others in addition to changing the learning environment from the familiar to the unfamiliar (Iran-Nejad et al., 1998; Iran-Nejad et al., 1995). Therefore, such an environment was provided for the participants of this study in an undergraduate educational psychology class. In doing so, participants of this study were asked to develop their own definitions, perceptions, interpretations, and conclusions concerning the nature of authentic learning and instruction - a subject that has become a hot topic for educators in recent years (Berlak, Newmann, Adams, Archbald, Burgess, Raven, & Romberg., 1992; Zemelman, Daniels, & Hyde, 1993). However, instead of taking time to directly address this topic in class, students are asked to reach such determinations as a result of their own reflections and insights that arise from reflection, personal exploration, and classroom observations.

Methods. Participants in the study are 40 undergraduate educational psychology students from a large Southeastern university. As part of a semester long project, students are asked to organize their thoughts on the nature of authentic learning and instruction through reflection, personal exploration, and classroom observation. At no point in the semester are students given any prior knowledge on the nature of authentic learning and instruction in their educational psychology classes. At the end of the semester, students are asked to report their decisions and conclusions in a paper. The papers of the students are graded by the instructor (who is also the author of this study) according to how well they defend their perceptions, decisions, and conclusions on the nature of authentic

learning. For the purposes of this study, however, student perceptions of authentic learning are rated as accurate or inaccurate according to specific research and reports on the nature of authentic learning and instruction. The literature used to support this rating scheme is presented below.

Research referred to and utilized to rate student perceptions of authentic learning and instruction as accurate or inaccurate include that of Cronin (1993), Iran-Nejad et al. (1998), Newmann and Archbald (1992), Newmann and Wehlage (1993), and Zemelman, Daniels, and Hyde (1993). According to these authors, authentic learning is regularly defined as learning or achievement that is significant and meaningful as opposed to that which is trivial and useless. Contend these authors, such learning is characterized as that which induces higher-order thinking, allows for deep levels of knowledge (i.e., goes beyond declarative and procedural knowledge), enables the individual to see the connectedness of subject matter to the world beyond the classroom, invokes substantive conversation among learners, provides an environment where individuals receive positive social support in their quest towards gaining understanding and knowledge, allows students to encounter and master situations that resemble real life, prepares the individual for future learning, and becomes something that the individual owns. According to Newmann and Wehlage, these characteristics ultimately reduce "to three criteria that are consistent with major proposals in the restructuring movement: (1) students construct meaning and produce knowledge, (2) students use disciplined inquiry to construct meaning, and (3) students aim their work toward production of discourse products and performances that have value or meaning beyond success in school" (1993, p. 8) (See Appendix A). For the purposes of this study, then, student papers that address these three criteria are rated as accurate perceptions of authentic learning and instruction. Those papers that only address one or two of the criteria and fail to address all three criteria are rated as inaccurate.

Some clarification is necessary concerning the rating of student perceptions and representations of authentic learning. For those students who only cite one to two of the prescribed criteria for authentic learning, it is not inferred that the students' perceptions of authentic learning are incorrect. This is because it was not possible to control for the problem of students who do have accurate representations but fail to mention all three criteria in their papers for whatever reasons. It is also not assumed that those students who list one or two criteria are not on their way towards completely accurate perceptions of authentic learning. Therefore, the rating terms of "accurate" and "inaccurate" should not be interpreted as ratings of "correct" or "incorrect." Instead, "accurate" and "inaccurate" are ratings referring to the completeness of the representation. It is not assumed that those rated as "inaccurate" do not have accurate representations or are not capable of achieving accurate representations. Their representations were simply incomplete at the time of their reports. Thus, the rating of "accurate" should be interpreted as a report that gives a complete representation of authentic learning (as the above literature interprets it), and the rating of "inaccurate" should be interpreted as a report that gives an incomplete representation of authentic learning.

The final component of the study involves rating the dispositional modes of functioning of the educational psychology students in terms of creative versus habitual, dynamic versus active, and constructive versus unconstructive at the end of the semester. Since no objective assessment instruments are available for all of the dispositional modes of functioning (although one is presently in development by Iran-Nejad & Cound, 1998), the educational psychology students/participants' dispositional modes of functioning were rated at the end of the semester by the educational psychology instructor, who has been educated in the rating of dispositional modes of functioning by Iran-Nejad, as creative or habitual, dynamic or active, and constructive or unconstructive. In addition to rating students according to dispositional modes of functioning, the instructor also indicated the degree of certainty from 1 to 5 (1 being the least degree of certainty and 5 being the

highest degree of certainty) (these degree of certain ratings are not used in the present analysis for reasons that will be discussed later). Given the nature of the classroom-based data collection process, no interrater agreement was possible.

Results. Table one (see Appendix B) presents the 2 X 2 contingency table representing the joint relationship between the modes of functioning and learning description categories. This table indicates that the optimal modes of functioning are a relatively low frequency category. However, it is more pronounced for the group accurately reporting authentic learning. Due to the measurement properties of the dependent measures, a phi coefficient was computed to assess the hypothesized relationship between dispositional modes of functioning and descriptions of authentic learning. Results of this analysis indicate a significant and moderate relationship ($phi(40) = .51$; $p = .001$). Thus, the data indicate a significant positive relationship among accurate reports of authentic learning and those rated in the optimal modes of functioning in addition to a significant positive relationship among inaccurate reports of authentic learning and those rated in the traditional modes of functioning.

Discussion. Results of this study provide initial support for the hypotheses. Therefore, those students in the creative, dynamic, and constructive modes of functioning may indeed be better prepared for future learning and benefited most where the production, reorganization, advancement, and utilization of knowledge is concerned while those in the habitual, active, and unconstructive modes of functioning are not as prepared and benefited in such a task. This study also reveals that those rated in the optimal modes of functioning and that reports of authentic learning rated as accurate are a decided minority.

The findings garnered in this study must be viewed as tentative given the preliminary nature of the study. There are a variety of reasons for this. Specifically, one notes the small sample size and the use of a single coder using a new measure. Although validity and reliability issues do arise as a result of the utilized single coder ratings, the students/participants' modes of functioning should be tentatively trusted and seen as valid

for several reasons. First, the nature of the educational psychology class is believed to involve a great amount of interaction among the students and instructor due to the small class size and wholetheme orientation of the class resulting in better than average teacher-student familiarity (see Iran-Nejad et al., 1995, for more specifics on wholetheme constructivism). Thus, through such wholetheme interaction, the instructor was better prepared to assess and rate student modes than would be an instructor of a large, lecture oriented class. Research on the effectiveness and validity of teacher ratings of students provide a second reason why this teacher rating of students system is tentatively valid. Research by Buell (1992) and Hearne & Schuman (1992) provides evidence that teacher ratings in certain areas can be as effective and as valid as objective assessments. A final reason why we can initially trust the validity of the ratings system involves the fact that the instructor of the classes had been instructed and versed by Iran-Nejad in the identification of the optimal modes of functioning (i.e., the creative, dynamic, and constructive modes) and traditional modes of functioning (i.e., the habitual, active, and unconstructive modes).

What we have from this pilot study, then, is the impetus to study this area further as well as the rationale to continue to develop means for assessing dispositional modes of functioning. Certainly future study should address these areas. Ideally, studies in the future in this area should seek to do the following to ensure that valid and reliable findings are found. First, a larger sample size is a must. Second, objective assessments for the determination of the optimal dispositional modes of functioning must be developed and utilized. As mentioned, such a measure is in development (Cound & Iran-Nejad, 1998). In the absence of an objective measure, future research of this type and in this area must seek to validate qualitative analysis of the dispositional modes of functioning. Such a validation process should include the use of multiple, objective raters instead of one (as was the case in this study). This will help to ensure interrater reliability where the ratings of dispositional modes of functioning are concerned. To do so, however, those raters should be those who have a good knowledge of the individual where academic ability,

motivation, self regulation, and other personality and performance related variables are concerned. Involving other raters in this study was not a possibility because it could not be guaranteed that other instructors of the students of this study possessed such knowledge.

Though a system involving multiple raters is critical, future study must also seek to ensure that raters are educated in the categorizing of an individual's modes of functioning. Raters must be trained and versed in the identification of the dispositional modes of functioning as was the case in this pilot study. Doing so will help to ensure that rated individuals are being rated according to the characteristics that define the optimal modes and not other variables such as GPA, intelligence quotient, personality type, etc.

Finally, studies in this area in the future must not only address the between-group variability among modes but also the within-group variability that seemingly exists. Possibilities for between-group variability could include the nature of instruction to which students are exposed. As mentioned, wholetheme approaches to learning and instruction show evidence of facilitating and stimulating the optimal dispositional modes of functioning. However, as is clear from this pilot study, not all of the participants were rated in the optimal modes (as seen, those rated in the three optimal modes were the minority) even though they had experienced a semester long assignment designed for such stimulation. Certainly there can be reasons speculated for this. For example, even though the assignment given to the students/participants might be considered to be wholetheme, the educational psychology class - although employing some wholetheme characteristics - was not truly wholetheme. Also, in all likelihood, the other classes in which the students/participants were enrolled were more than likely not wholetheme approaches to learning and instruction. Therefore, the majority of environmental circumstances that students of this study experienced did not allow for effective stimulation of the optimal modes. With this in mind, the existence of both the optimal and traditional modes among the population of this study should not be a surprise. Future research in this area must go

beyond speculation like this and seek conclusive evidence as to what specifically accounts for such variability and growth between the modes of functioning.

In the future, a means that may help to better account for the variability that exists within the modes of functioning and student descriptions of authentic learning may be to include the degree of certainty ratings in the analysis. For example, it is possible that such an analysis may find that those who are seen as most certainly optimal are regularly producing accurate and complete descriptions of authentic learning, while those who are seen as most certainly traditional are regularly producing inaccurate or incomplete descriptions of authentic learning. Such could not be accounted for in this study due to the inconsistency in the cited degrees of certainty. Also, the purpose of this study was to address the association between the two variables, not account for variability. Nonetheless, however, such within-group variability should be explored.

Summary. This pilot study does find evidence that those cited as being in the creative, dynamic, and constructive modes of functioning are best prepared to generate, reorganize, and produce knowledge and that these modes do seem to be of valuable and possibly primary importance to the learner. In addition to confirming the 1992 findings of Iran-Nejad & Chissom concerning the importance of the dynamic mode where learning, performance, and reorganization of knowledge is concerned, these preliminary findings additionally acknowledge the importance of the creative and the constructive modes which therefore provides tentative evidence concerning the usefulness and significance of all three optimal modes. Because of validity questions due to the rating system, a lack of interrater reliability to test ratings due to the inability to involve other instructors, and the small sample size of this study, this study should strictly be viewed as a pilot study and any inferences resulting from this study must remain tentative at best. Regardless of such cautions, though, we can begin to tentatively confirm what the previously cited research has allowed for: that the three optimal modes of functioning, as suggested by biofunctional cognitive theory, do indeed seem to be of critical importance to the learner.

Thus, there is the impetus for further study in this area, but future study must address some of these issues such as validity and reliability concerns, what causes variability and growth among the modes in study populations, and why those in found in the optimal modes are often in the minority.

Implications of both present and future research in this area are great. This is particularly true in the area of educational reform. As we have seen in most recommendations for reform, reform is most often seen as necessary where learning and instruction is concerned (Berlak et al., 1992; McGilly, 1994; Zemelman et al., 1993). Certainly this is of critical importance. What modes of functioning research such as this is also telling us is that we must also reassess what we know about human functioning where generating knowledge and learning is concerned. Therefore, reform will not only involve restructuring classroom processes and approaches to instruction and learning. Instead, it will also involve restructuring our educational environments and classroom processes so that they parallel, accommodate, and stimulate the biofunctional processes and capabilities of our students. As most biofunctional research in the modes of functioning area contend, today's classroom most often spurs the habitual, active, and unconstructive modes. Thus, as educators, we must be prepared and willing to research and seek a variety of means that will stimulate and facilitate the emergence of the creative, dynamic, and constructive or optimal modes of functioning rather than the traditional modes. From this, not only will we hopefully see those operating out of the optimal modes of functioning move from the minority (as was the case in this study) to the majority, we will also begin to see that the majority of the individuals emerging from our schools are more adept in the processes of acquiring new knowledge, organizing and reorganizing the knowledge base, and determining the relevance and utility of such knowledge to their lives.

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Appendix A

Three identified criteria of authentic learning as conceptualized by Newmann & Wehlage (1993) and addressed by Cronin (1993), Iran-Nejad et al. (1998), Newmann & Archbald (1992), and Zemelman et al. (1993).

I. Students construct meaning and produce knowledge.
   a. Authentic learning induces higher order thinking.
   b. Authentic learning allows for deep levels of knowledge.
   c. Authentic learning becomes something the student truly owns.

II. Students use disciplined inquiry to construct meaning.
   a. Authentic learning invokes substantive conversation among learners.
   b. Authentic learning provides an environment where individuals receive positive social support in their quest towards gaining, understanding, and utilizing knowledge.

III. Students aim their work toward production of discourse products and performances that have value or meaning beyond success in school.
   a. Authentic learning enables the individual to see the connectedness of subject matter to the world beyond the classroom.
   b. Authentic learning prepares the individual for future learning.
   c. Authentic learning allows students to encounter and master situations that resemble real life.

Appendix B

Phi coefficient 2 X 2 contingency table

		Mode of Functioning: *Traditional* (0)	*Optimal* (1)	
Reports of authentic learning	*Accurate* (1)	2	8	10
	Inaccurate (0)	23	7	30
		25	15	40

phi = .5068, p=.001